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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/008,432	11/13/2001	Zheng Chen	M61.12-0370	3038

27366 7590 07/21/2005

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EXAMINER	
SKED, MATTHEW J	

ART UNIT	PAPER NUMBER
2655	

DATE MAILED: 07/21/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/008,432	CHEN ET AL.	
	Examiner	Art Unit	
	Matthew J. Sked	2655	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-22 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-22 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 13 November 2001 is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date 8/14/02
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1 and 2 are rejected under 35 U.S.C. 103(a) as being unpatentable over Roberts (U.S. Pat. 5,765,132) in view of Bayer (U.S. Pat. 6,885,758).

As per claim 1, Roberts teaches a method of decoding input, the method comprising:

identifying possible sequences of words from the input (system recognizer recognizes a sequence of words from the user's input, Fig. 5, elements 50 and 52);

using a language model and an entity dictionary to select one of the possible sequences of words as an output sequence (recognizer has a vocabulary with multiple speech models based on probability distributions and would inherently have a dictionary in order to convert from the chosen model to a word in order to output the recognized words, col. 4, lines 41-51 and Fig. 5, element 52);

receiving modifications made to the output sequence (user corrects the recognized word sequence, col. 5, lines 11-21 and Fig. 5, element 54); and

using the modifications to change the entity dictionary (generates a speech model for the new word and adds this model and the new word to the vocabulary, col. 8, lines 4-9 and Fig. 5, element 92).

Roberts does not teach the language model and entity dictionary to be class-based.

Bayer teaches a method of updating dictionaries where the dictionaries contain sets of word classes (col. 5, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to use class-based language models and dictionaries as taught by Bayer because it more clearly reference the entries in the dictionary hence decreasing searching time.

3. As per claim 2, Roberts teaches that using the modifications to change the entity dictionary comprises using the modifications to add an entity to the entity dictionary (generates a speech model for the new word and adds this model and the new word to the vocabulary, col. 8, lines 4-9 and Fig. 5, element 92).

4. As per claim 3, Roberts does not teach adding as entity to the class entity dictionary comprises adding an entity to a class in the class entity dictionary.

Bayer teaches assigning the training words into classes hence adding the words into a class (col. 5, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to add words to a class in the dictionary as taught by Bayer because it more clearly reference the entries in the dictionary hence decreasing searching time.

5. As per claim 4, Roberts teaches estimating a probability for the added entity (generates a new speech model hence generating a probability, col. 8, lines 4-9).

Roberts does not teach estimating the probability given the class to which the entity is added.

Bayer teaches calculating the probability for each class, which is composed of the frequencies of the elements of each class, the probability for an entity is based upon frequency counts of the training data (col. 5, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to estimate the probability given the class to which the entity is added as taught by Bayer because this would make the probabilities contingent on the classes hence making a word more probable when the class is determined.

6. As per claim 5, Roberts teaches receiving a modified entity that represents a modification of a decoded entity in the output sequence and wherein adding an entity comprises adding the modified entity (system receives modified recognition result and adds it as a new word, col. 5, lines 11-21).

7. As per claim 6, Roberts suggests estimating the probability based in part on a probability associated with the decoded entity (approximates the syllables that corresponds to the input in order to calculate the model and because the new word would share some of the same syllables as the recognized word the probabilities would be linked by the syllable approximations, col. 6, line 46 to col. 7, line 5).

8. As per claim 7, Roberts does not teach estimating the probability based on an n-gram probability associated with the decoded entity and an n-gram probability associated with the class to which the modified entity is added.

Bayer teaches calculating frequencies of n-tuple word groups in each class (col. 6, line 42 to col. 7, line 7).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to estimate the probability based on an n-gram probability associated with the decoded entity and an n-gram probability associated with the class to which the modified entity is added as taught by Bayer because this would allow the system to recognize highly probable word strings hence giving better results.

9. As per claims 8 and 10, Roberts suggests increasing and decreasing a probability associated with an entity in the entity dictionary (new word models are further trained through future utterances of the words hence the probabilities would be changed which would either be an increase or a decrease in the probability, col. 8, lines 28-34).

10. As per claim 9, Roberts teaches receiving a modified entity that represents a modification of a decoded entity in the output sequence and wherein the modified entity is found in the entity dictionary (speech models are further trained after copied into the vocabulary, col. 8, lines 28-34).

11. As per claim 11, Roberts teaches receiving a modified entity that represents a modification of a decoded entity in the output sequence and wherein the modified entity is not found in the entity dictionary but the decoded entity is found in the class entity dictionary (receives a change to the recognized output where the recognized word is in the vocabulary, col. 5, lines 11-21).

12. As per claim 12, Roberts and Bayer do not teach decreasing the probability of the decoded entity.

However, the Examiner takes Official Notice that decreasing the probability of misrecognized words is well known in the art. Therefore, it would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts and Bayer to decrease the probability of the decoded entity because this would help prevent this misrecognition from occurring in the future.

13. As per claim 13, Roberts teaches a computer-readable medium having computer-executable instructions for performing steps comprising:

generating a sequence of words based in part on an entity dictionary that provides probabilities for entities (system generates a recognition result using probabilistic models in a vocabulary, col. 4, lines 41-51 and col. 5, lines 11-21);

receiving a modification to the sequence of words such that a decoded entity in the sequence of words is modified into a modified entity (user modifies the recognition results, col. 5, lines 11-21); and

setting a probability of an entity in the entity dictionary based at least in part on the modified entity (generates a new probabilistic model for the new word and adds it to the vocabulary, col. 8, lines 4-9).

Roberts does not teach the language model and entity dictionary to be class-based.

Bayer teaches a method of updating dictionaries where the dictionaries contain sets of word classes (col. 5, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to use class-based language models and dictionaries as taught by Bayer because it more clearly reference the entries in the dictionary hence decreasing searching time.

14. As per claim 14, Roberts teaches adding the modified entity to the entity dictionary and selecting a probability for the modified entry (generates a probabilistic speech model for the new word and adds this model and the new word to the vocabulary, col. 8, lines 4-9 and Fig. 5, element 92).

15. As per claim 15, Roberts suggests estimating the probability based in part on a probability associated with the decoded entity (approximates the syllables that corresponds to the input in order to calculate the model and because the new word would share some of the same syllables as the recognized word the probabilities would be linked by the syllable approximations, col. 6, line 46 to col. 7, line 5).

16. As per claim 16, Roberts teaches estimating a probability for the added entity (generates a new speech model hence generating a probability, col. 8, lines 4-9).

Roberts does not teach estimating the probability given the class to which the entity is added.

Bayer teaches calculating the probability for each class, which is composed of the frequencies of the elements of each class, the probability for an entity is based upon frequency counts of the training data (col. 5, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to estimate the probability given the class to

which the entity is added as taught by Bayer because this would make the probabilities contingent on the classes hence making a word more probable when the class is determined.

17. As per claim 17, Roberts does not teach estimating the probability based on an n-gram probability associated with the decoded entity and an n-gram probability associated with the class to which the modified entity is added.

Bayer teaches calculating frequencies of n-tuple word groups in each class (col. 6, line 42 to col. 7, line 7).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to estimate the probability based on an n-gram probability associated with the decoded entity and an n-gram probability associated with the class to which the modified entity is added as taught by Bayer because this would allow the system to recognize highly probable word strings hence giving better results.

18. As per claims 18 and 20, Roberts suggests increasing and decreasing a probability associated with an entity in the entity dictionary (new word models are further trained through future utterances of the words hence the probabilities would be changed which would either be an increase or a decrease in the probability, col. 8, lines 28-34).

19. As per claim 19, Roberts teaches receiving a modified entity that represents a modification of a decoded entity in the output sequence and wherein the modified entity is found in the entity dictionary (speech models are further trained after copied into the vocabulary, col. 8, lines 28-34).

20. As per claim 21, Roberts teaches receiving a modified entity that represents a modification of a decoded entity in the output sequence and wherein the modified entity is not found in the entity dictionary but the decoded entity is found in the class entity dictionary (receives a change to the recognized output where the recognized word is in the vocabulary, col. 5, lines 11-21).

21. As per claims 22, Roberts teaches method of adapting a class entity dictionary used with a class-based language model, the method comprising:

receiving a user modification of a sequence of words that were identified based in part on the language model (user modifies the recognition results determined from the vocabulary, col. 5, lines 11-21);

identifying a decoded segment that has been modified to become a modified segment in the user modification (identifies new word, col. 5, lines 11-21); and

determining a probability for the modified segment based in part on the decoded segment (generates a new model for the new word (approximates the syllables that corresponds to the input in order to calculate the model and because the new word would share some of the same syllables as the recognized word the probabilities would be linked by the syllable approximations, col. 6, line 46 to col. 7, line 5).

Roberts does not teach the language model and entity dictionary to be class-based.

Bayer teaches a method of updating dictionaries where the dictionaries contain sets of word classes (col. 5, lines 54-64).

It would have been obvious to one of ordinary skill in the art at the time of invention to modify the system of Roberts to use class-based language models and dictionaries as taught by Bayer because it more clearly reference the entries in the dictionary hence decreasing searching time.

Conclusion

22. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Bub et al. (U.S. Pat. 6,460,017) teaches adapting language models to newly added words to a lexicon. Lee et al. (U.S. Pat. Pub. 2002/00873009A1) teaches adapting probabilities of stored words based upon user input. Honda et al. (U.S. Pat. 6,879,956) teaches adapting language models based on feedback. Anick et al. (U.S. Pat. 5,251,316) and Hon et al. (U.S. Pat. 5,852,801) teach dynamic lexicons.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Sked whose telephone number is (571) 272-7627. The examiner can normally be reached on Mon-Fri (8:00 am - 4:30 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wayne Young can be reached on 571-272-7582. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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07/07/05

SUSAN MCFADDEN
PRIMARY EXAMINER